

Is Chlorine in Live Wells a Problem? R. Williams, T. Groves, E. McJett III, and J.W. Love

Chlorine in water may harm fish and react with ammonia to produce another chemical, chloroamines. Larger fish may be harmed more than smaller fish, but responses are species-specific. The level of 0.4 ppm can be lethal to sunfish and bullhead¹. For smallmouth bass, 0.5 ppm can be lethal. Some species, such as trout, salmon, and some minnows, are much more sensitive to chlorine levels (0.01 ppm to 0.1 ppm)¹. When cooling live wells or transport tanks on release boats with ice, anglers may be adding chlorine to the tanks, which could adversely affect survivorship of black bass.

We conducted a study to determine the level of total chlorine in water baths (10 gallons) filled with well water that is cooled with store-bought ice. Ice was purchased from four vendors near Smallwood State Park (Potomac River, Maryland), which is a site of operation for many black bass tournaments. These vendors were 7-eleven, Mattawoman BP gas, a grocery store, and Nicks of Clinton. A fifth vendor, Gray's Store, reportedly uses well water to manufacture ice and was therefore not included in this study. The weight of ice ranged from 7 – 8 pounds. Ice brands were: Easton Ice, Penguin Ice, Crystal Ice, and Fresh Sparkling Ice.

All tests were conducted on 24 July 2009 at the Southern Division Regional Office for Maryland Department of Natural Resources. For one treatment group, the bags were inserted into the water bath and allowed to melt in sunlight and air temperature, 80 F. For the second treatment group, the bag was ripped and ice was poured into the water bath. After thirty minutes, all ice had melted into the water bath and the level of total chlorine was tested using chlorine strips (AquaCheck from Hach Suppliers). The chlorine strips measured total chlorine in parts per million at increments of: 0, 0.5, 1.0, 2.0, 4.0, and 10.0. If harmful levels of chlorine were present, we hypothesized those levels would be detected at 0.5 ppm or higher.

Water temperatures dropped from an average of 69° F to 66° F after 30 minutes, and then increased to 69° F after another 30 minutes (Table 1). For all tests, the level of chlorine was essentially 0 ppm. As a result, we found no evidence that harmful levels of total chlorine were present for fish as our vendor supplied ice was melted into water. However, because chlorine levels may be much higher in municipal tap water (near 4 ppm), it is possible that frozen tap water could result in harmful levels of dissolved chlorine if chlorinated tap water is used to cool transport tanks containing black bass. **Our recommendations** are: 1) use ice from a vendor that generates ice from well-water that is free of chlorine; or 2) fill a jug with water, loosen the lid slightly, freeze the water in the jug, tighten the lid, and then use the jug to cool the water of live wells.

Table 1. Bags of ice from vendors near Smallwood State Park (Maryland) were melted in a bath of 10 gallons of well water to detect chlorine levels after 30 minutes and at a measured temperature. Ice was melted in the bag (TMT 1) and released directly into the well water (TMT 2).

Vendor	Brand Name	Chlorine Level (ppm)		Temp (°F)
		TMT 1	TMT 2	
7-Eleven	Easton Ice (7 lbs)	0	0	66.5
BP gas	Penguin Ice (8 lbs)	0	0	62.0
Food In Grocery	Crystal Ice (8 lbs)	0	0	66.0
Nicks of Clinton	Fresh Sparkling (8 lbs)	0	0	69.5

¹ Roseboom, D. P., and D. L. Richey. 1977. Acute Toxicity of Residual Chlorine and Ammonia to Some Native Illinois Fishes. Illinois State Water Survey, Urbana, Report of Investigation 85.